

# Data caps may make data congestion worse

RCR Wireless

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I have argued for a long time that unlimited data plans are unsustainable – or basically that they are marketing fiction, because available wireless capacity is unfailingly limited, and subscribers cannot escape that fact no matter what operators tell them. And they have all experienced that when their connection becomes unbearably slow, or the device fails to even connect.

Yet, after looking more closely at data usage, I have come to the conclusion that data caps are not an effective way to manage the traffic congestion that unlimited plans threaten to bring. In fact, they are likely to leave traffic congestion unaffected or even make it worse, even as operators keep overall traffic levels under control.

I am certainly not advocating to get rid of traffic caps. Operators need to have some way to protect their networks from abuse, and to ensure that all subscribers have fair access to network resources. Caps prevent the few data hogs among us from ruining the experience for everybody else.

It is the extensive use of traffic caps to control traffic and used as the main tool to differentiate data plans that I find worrying, as they will have an impact on how subscribers use the service.

How should we expect subscribers to change their behavior in response to more restrictive traffic caps that operators like Verizon have started to actively enforce?

My first guess is that subscribers will over-react. While only a small percentage of subscribers is affected by traffic caps, many more think they are. This is simply due to the fact that most subscribers do not know how much data they are using (and if pressed they often overestimate use) and that to avoid additional charges or to be left without allowance they will reduce their data consumption. Of course, having subscribers constantly worried as to whether they can afford to watch a YouTube video or post a photo is not good for business. It reduces the value subscribers attach to the service.

More importantly, however, I expect subscribers to selectively react to traffic limitations. To extract more value from their data plans, subscribers are likely to increase data usage during peak time, and, to compensate, they are willing to cut less important activities during off-peak times.

Subscribers will still post photos to Facebook, look at a funny video as they wait for the bus, or use Skype for a video call. However, they may cut usage from home or office, unless they have Wi-Fi there (and in this case their traffic is already off-network), or keep down the number of installed applications and avoid frequent updates, and generally avoid all the data traffic that is deemed to be less important or that can be carried over a different device/data channel (e.g., desktop in the office, or Wi-Fi tablet at home).

Effectively, this translates into higher percentage of the monthly traffic concentrated during peak time and lower usage during off-peak time. The higher usage at peak hour is

driven by the fact that most people find it more desirable to use their service at that time – this is why it is peak-hour in the first place.

In absence of strict caps, we expect subscribers to generate more traffic, but also to do so more spontaneously, without having to worry whether they should go to their desktop or tablet to see a video, instead of using their smartphone. As a result, I would expect that overall traffic consumption goes up, but traffic at peak would remain largely unaffected as this is not the traffic that subscribers are trying to reduce. In fact, awareness of tight traffic constraints may even drive peak-hour usage up as subscribers try to maximize value of their plans.

Let's look at this from a network perspective. Operators only care about peak traffic. They dimension (and pay for) their network deployments based on forecasted peak traffic. During off-peak times, the networks are inevitably underutilized – and during that time, network capacity is effectively free and abundant. Vodafone stated that their network utilization is 35% in Europe. Most operators do not release this data, but in the US network utilization is likely to be even lower than this.

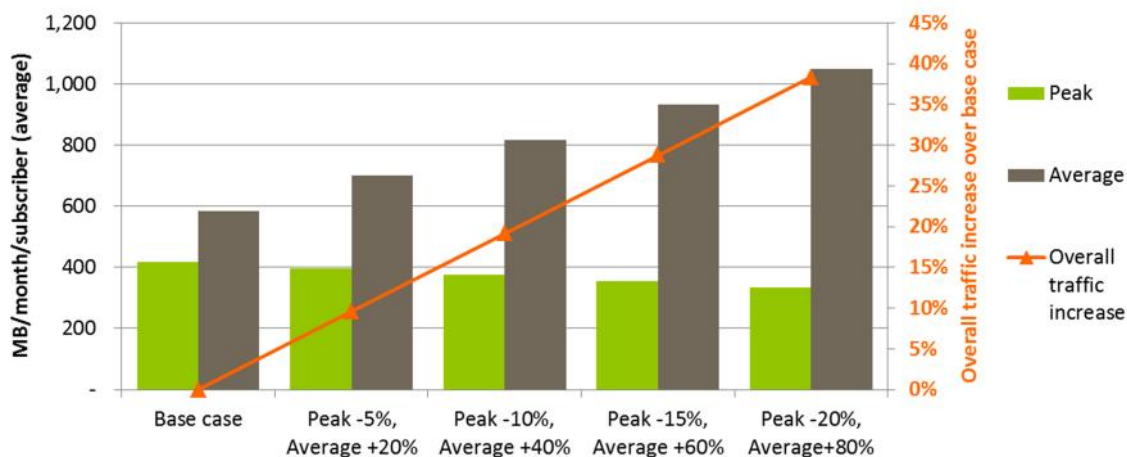
If traffic caps do not impact peak-hour traffic, they are not effective at reducing traffic congestion, which is a peak-hour occurrence. To make things worse, they curtail off-peak

traffic, when the marginal cost of carrying additional traffic is extremely low. It is a losing proposition for the operator and the subscriber alike.

It is not the overall monthly data traffic volume by a subscriber, but when and where it is generated that is crucial. Operators would be better off with higher traffic volumes, as long as they are not during peak hours.

Let's imagine that subscribers have a plan with caps that apply to peak times only and unlimited access at other times. During off-peak times, a green dot appears on the smartphone and subscribers know that then their data usage does not count against their data allowance. In this case, we would expect overall higher data consumption, but more diluted through the day.

The figure below shows what may happen in this scenario, with different rates of peak/off-peak substitution, assuming that the increase in non-peak traffic will be four-times as large as the decrease in peak traffic. Starting from a base case of a usage of 1 GB / month (current average usage is around 500 MB, and with the current traffic growth rates, average traffic per month will probably hit the 1 GB mark next year in the US), the overall traffic grows, up to 38%, while the peak traffic decreases. This is much better prospects for both operators that see their network utilization go up, and for subscribers freed by some of the traffic caps constraints.



Source: Senza Fili Consulting

## About Senza Fili



Senza Fili Consulting is an analyst and consulting firm that provides advisory services on wireless data technologies and services since 2003. At Senza Fili we have in-depth expertise in financial modeling, market forecasts and research, white paper preparation, business plan support, RFP preparation and management, due diligence, and training. Our client base is international and spans the entire value chain: clients include wireline, fixed wireless, and mobile operators, other service providers, enterprises and other vertical players, vendors, system integrators, investors, regulators, and industry associations.

We provide a bridge between technologies and services, helping our clients assess established and emerging technologies, leverage these technologies to support new or existing services, and build solid, profitable business models. Independent advice, a strong quantitative backing, and an international perspective are the hallmarks of our work.

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## About the author



Monica Paolini, PhD, is the founder and president of Senza Fili. She is an expert in wireless technologies and has helped clients worldwide to understand technology and customer requirements, evaluate business plan opportunities, market their services and products, and estimate the market size and revenue opportunity of new and established wireless technologies. She has frequently been invited to give presentations at conferences and has written several reports and articles on wireless broadband technologies. She has a PhD in cognitive science from the University of California, San Diego (US), an MBA from the University of Oxford (UK), and a BA/MA in philosophy from the University of Bologna (Italy). She can be contacted at [monica.paolini@senzafileconsulting.com](mailto:monica.paolini@senzafileconsulting.com).

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